

CLAIMS

1. A molded plastic segment for use in a subterranean structure of the type comprising a cylindrical body made up of at least one tier of segments, each segment comprising:

5 a wall element cylindrically curved about a vertical axis having an inside surface and an outside surface, vertical side edges and horizontal top and bottom edges, a first of the vertical side edges including a protruding mating element that is vertically tapered, and a second of the vertical side edges including a slot that is vertically tapered, the vertical
10 side edges including confronting surfaces adapted to be brought into abutting relationship in any interlocking engagement between adjacent segments of similar construction.

2. The molded plastic segment of claim 1 wherein the protruding mating element comprises a dovetail extending continuously along the first
15 vertical side edge, the dovetail including a distal portion having a width of continuously varying dimension to achieve the vertical taper.

3. The molded plastic segment of claim 1 further comprising a flange protruding vertically from one of the horizontal edges to overlap a portion of one of the inside and outside surfaces of a vertically adjacent segment.

20 4. The molded plastic segment of claim 2 further comprising a protuberance on a surface of the protruding dovetail and a corresponding surface feature on a surface of the slot for providing interference between interlocking vertical surfaces when the horizontal edges of two adjacent segments are aligned.

25 5. The molded plastics segment of claim 1 wherein the vertical side edges are separated from each other by 120° measured about the vertical axis.

6. The molded plastic segment of claim 1 further comprising a plurality of ribs on said outside surface.

7. A subterranean structure having a body cylindrical about a vertical axis, made up of at least one ring, each ring consisting essentially of a plurality of horizontally adjacent segments of molded plastic, each segment comprising:

5 a wall element cylindrically curved about a vertical axis having an inside surface and an outside surface, vertical side edges and horizontal top and bottom edges, a first of the vertical side edges including a protruding mating element that is vertically tapered, and a second of the vertical side edges including a slot that is vertically tapered, the vertical
10 side edges including confronting surfaces brought into abutting relationship by an interlocking engagement between the mating elements and slots on the horizontally adjacent segments of similar construction.

8. A subterranean structure of claim 7 wherein the protruding mating element on each segment comprises a dovetail extending continuously
15 along the first vertical side edge, the dovetail including a distal portion having a width of continuously varying dimension to achieve the vertical taper.

9. A subterranean structure of claim 7 wherein each segment further comprises a flange protruding vertically from one of the horizontal edges to
20 overlap a portion of one of the inside and outside surfaces of a segment of a vertically adjacent ring.

10. A subterranean structure of claim 7 wherein each segment further comprises a protuberance on a surface of each protruding dovetail and a corresponding surface feature on a surface of each dovetail slot providing
25 interference between interlocking vertical surfaces when the horizontal edges of two adjacent segments are aligned.

11. A subterranean structure of claim 7 wherein the vertical side edges of each segment are separated from each other by 120° measured about the vertical axis.

12. A subterranean structure of claim 7 further comprising a plurality of dimples on a surface of each element facilitating the drilling of holes for mounting hardware to the surface.

13. A subterranean structure of claim 12 further comprising a security net including a plurality of radial strands and crossing strands coupled to the radial strands, and a plurality of fasteners coupled to the ends of the radial strands for connecting the radial strands to said mounting hardware on the inside surface of the subterranean structure, the strands being fixed sufficiently close to each other to inhibit accidental entry into the subterranean structure by small animals and children while still providing small openings of sufficient size to allow access by a suction hose or the like.

14. A subterranean structure of claim 7 further comprising a cover contacting said horizontal top edge of an uppermost of the rings forming the subterranean structure, and means for securing the cover to the uppermost of the rings.

15. A method of assembling a subterranean structure from a plurality of segments, each segment formed of a wall element cylindrically curved about a vertical axis having an inside surface and an outside surface, vertical side edges and horizontal top and bottom edges, a first of the vertical side edges including a protruding mating element that is vertically tapered, and a second of the vertical side edges including a slot that is vertically tapered, the method including the steps of:

sliding a protruding mating element of one segment into the vertically tapered slot of an adjacent segment until the top and bottom edges of the adjacent segments are aligned,

repeating the sliding step with additional segments until sufficient segments are joined together horizontally to complete a ring except for a last adjacent pair of vertical side edges,

warping the joined segments by a distance sufficient to align the protruding mating element and tapered slot of the last pair of vertical side edges, and

engaging the mating portions of the last pair of vertical side edges while un-warping the joined segments until the top and bottom edges of all the segments are aligned to complete the ring.

16. The method of claim 15 further comprising the steps of providing a flange protruding vertically from one of the horizontal edges of the segments, and

stacking the completed ring on another ring of similar structure so that the protruding flange overlaps a portion of one of the inside and outside surfaces of said another ring.

17. The method of claim 15 further comprising the step of adding a bonding agent compatible with the polymers forming the segments between adjacent segments.

18. The method of claim 16 further comprising the step of shortening vertically one set of segments prior to forming one of the completed rings.

19. A security net for use in vertical access chambers of subterranean structures, the security net comprising

a plurality of radial strands and crossing strands coupled to the radial strands, a plurality of fasteners coupled to the ends of the radial strands for connecting the radial strands to an inside surface of the vertical access chamber, the strands being fixed sufficiently close to each other to inhibit accidental entry into the subterranean structure by small animals and children while still providing small openings of sufficient size to allow access by a suction hose or the like.

20. A cover for contacting an horizontal top edge of an uppermost ring forming a subterranean structure, the cover comprising

a plate having an upper and a lower surface, the lower surface including an outer rim for contact with said top edge, a plurality of rods coupled to the lower surface for movement relative to the plate, each rod including a proximal end and a distal end, the distal end being adapted to protrude into a receiving pocket located on an inside surface of the subterranean structure, a cam coupled to the proximal end of each rod, the cam being movable from the upper surface of the plate to cause movement of the proximal ends of the rods between a locked and an unlocked position for securing and releasing the cover to the uppermost ring.

21. The cover of claim 20 further comprising an opening in the plate aligned with a central portion of the cam for receiving a key, the cam including a niche located below the plate opening for receiving a corresponding key inserted through the plate opening, the niche facilitating movement of the cam by the key to move the rods between the locked and unlocked positions.

22. The cover of claim 21 wherein the opening in the plate includes an edge shaped to capture any key inserted in the cam niche when the cam is moved to the unlocked position.